SEQUENCE LISTING

<110> Duvick, Jon
Maddox, Joyce
Gilliam, Jacob
Folkerts, Otto
Crasta, Oswald R.

<120> Compositions and Methods for Fumonisin Detoxification

<130> 35718/208255

<140> 09/882,694
<141> 2001-06-15

<150> 09/351,224
<151> 1999-07-12

<160> 11

<170> FastSEQ for Windows Version 4.0

<210> 1
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<212> DNA
<213> Exophiala spinifera

<220>
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<222> (0)...(0)
<223> flavin monooxygenase with intron

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<210> 2
<211> 1638
<212> DNA
<213> Exophiala spinifera

<220>
<221> misc_feature
<222> (0)...(0)
<223> flavin monooxygenase, fully spliced

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tggtggactg gaggcaacat ccctgggaaa gcaacacgtg ctttaacctt cataggcggg 1560
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cttcatgctc cctgctaa 1638

<210> 3
<211> 545
<212> PRT
<213> Exophiala spinifera

<400> 3

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Leu Arg Lys Leu Arg Leu Asn Ala Lys Ile Phe Glu Gly Ala Pro Asp
        35                  40                  45
Phe Gly Gly Val Trp His Trp Asn Arg Tyr Pro Gly Ala Arg Val Asp
    50                  55                  60
Ser Glu Thr Pro Phe Tyr Gln Leu Asn Ile Pro Glu Val Trp Lys Asp
65                  70                  75                  80
Trp Thr Trp Ser Cys Arg Tyr Pro Asp Gln Lys Glu Leu Leu Ser Tyr
                85                  90                  95
Val His His Cys Asp Lys Ile Arg Gly Leu Arg Lys Asp Val Tyr Phe
            100                 105                 110
Gly Ala Glu Val Val Asp Ala Arg Tyr Ala Arg Asp Leu Gly Thr Trp
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Thr Val Lys Thr Ser Ala Gly His Val Ala Thr Ala Lys Tyr Leu Ile
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Leu Ala Thr Gly Leu Leu His Arg Lys His Thr Pro Ala Leu Pro Gly
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Leu Ala Asp Phe Asn Gly Lys Val Ile His Ser Ser Ala Trp His Glu
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Asp Phe Asp Ala Glu Gly Gln Arg Val Ala Val Ile Gly Ala Gly Ala
            180                 185                 190
Thr Ser Ile Gln Ile Val Gln Glu Leu Ala Lys Lys Ala Asp Gln Val
        195                 200                 205
Thr Met Phe Met Arg Arg Pro Ser Tyr Cys Leu Pro Met Arg Gln Arg
    210                 215                 220
Thr Met Asp Arg Asn Glu Gln Thr Ala Trp Lys Ala Tyr Tyr Pro Thr
225                 230                 235                 240
Leu Phe Glu Ala Ser Arg Lys Ser Arg Ile Gly Phe Pro Val Gln Ala
                245                 250                 255
Pro Ser Val Gly Ile Phe Glu Val Ser Pro Glu Gln Arg Glu Ala Tyr
            260                 265                 270
Phe Glu Glu Leu Trp Glu Arg Gly Ala Phe Asn Phe Leu Ala Cys Gln
        275                 280                 285
Tyr Arg Glu Val Met Val Asp Lys Lys Ala Asn Arg Leu Val Tyr Asp
    290                 295                 300
Phe Trp Ala Lys Lys Thr Arg Ser Arg Ile Val Asn Pro Ala Lys Arg
305                 310                 315                 320
Asp Leu Met Ala Pro Leu Glu Pro Pro Tyr Trp Phe Gly Thr Lys Arg
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Ser Pro Leu Glu Ser Asp Tyr Tyr Glu Met Leu Asp Lys Pro Ser Val
            340                 345                 350
Glu Ile Val Asn Leu Glu Gln Ser Pro Ile Val Ala Val Thr Lys Thr
        355                 360                 365
Gly Val Leu Leu Ser Asp Gly Ser Lys Arg Glu Cys Asp Thr Ile Val
    370                 375                 380
Leu Ala Thr Gly Phe Asp Ser Phe Thr Gly Ser Leu Thr His Met Gly
385                 390                 395                 400
Leu Lys Asn Lys His Gly Val Asp Leu Lys Glu Val Trp Lys Asp Gly
                405                 410                 415
Ile Ser Thr Tyr Met Gly Val Phe Ser His Gly Phe Pro Asn Ala Phe
            420                 425                 430
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Phe Val Ala Thr Ala Gln Ala Pro Thr Val Leu Ser Asn Gly Pro Thr
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Ile Ile Glu Thr Gln Val Asp Leu Ile Ala Asp Thr Ile Ala Lys Leu
    450                 455                 460
Glu Ala Glu His Ala Thr Ser Val Glu Ala Thr Lys Ser Ala Gln Glu
465                 470                 475                 480
Ala Trp Ser Ile Met Ile Ala Lys Met Asn Glu His Thr Leu Phe Pro
                485                 490                 495
Leu Thr Asp Ser Trp Trp Thr Gly Gly Asn Ile Pro Gly Lys Ala Thr
            500                 505                 510
Arg Ala Leu Thr Phe Ile Gly Gly Ile Ala Leu Tyr Glu Gln Ile Cys
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Gln Glu Lys Val Ala Asn Trp Asp Gly Phe Asp Val Leu His Ala Pro
    530                 535                 540
Cys
545
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<210> 4
<211> 1464
<212> DNA
<213> Exophiala spinifera

<220>
<221> misc_feature
<222> (0)...(0)
<223> aldehyde dehydrogenase, fully spliced cDNA

<400> 4
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gatgttcacg tggccaacgc ggccgatgtc gacagtgcag tagccgcttc ggtgcaggcg 180
gtcaaaaagg gcccatggaa gaagttcaca ggtgcacaac gcgcggcgtg catgcttaag 240
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tactatgcag gctgggccga caagatcgcc ggaaagacct ttcccgagga caacggcaag 420
ccgaattggc gttacgagcc gatgggggtg tgtgctggta ttgccagctg gaacgcgact 480
tttctttacg tcggctggaa gatagccccc gccctcgccg ccggctgctc cttcatcttc 540
aaagcctcgg agaaatcccc gctgggcgtt ctgggcctcg ctcctctctt cgcagaagcc 600
ggattccctc ctggagtcgt gcagttcctc actggagcac gagtgacggg tgaagcattg 660
gcgtcgcaca tggacattgc gaagatcagc ttcacaagat ctgtcggcgg tggccgcgcc 720
gtcaagcaag caacactcaa gtccaacatg aagcgcgtca ctctagaact gggggaaaag 780
ccaaccatcg tcttcaacga agctcctctc gaacggcagt cgggggaatc ggcaaaggat 840
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<210> 5
<211> 487
<212> PRT
<213> Exophiala spinifera

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Trp Asp Glu Ser Thr Val Ala Thr Asp Val His Val Ala Asn Ala Ala
        35   40   45
Asp Val Asp Ser Ala Val Ala Ala Ser Val Gln Ala Val Lys Lys Gly
    50   55   60
Pro Trp Lys Lys Phe Thr Gly Ala Gln Arg Ala Ala Cys Met Leu Lys
65   70   75   80
Phe Ala Asp Leu Ala Glu Lys Asn Ala Glu Lys Leu Ala Arg Leu Glu
                85   90   95
Ser Leu Pro Thr Gly Arg Pro Val Ser Met Ile Thr His Phe Asp Ile
            100   105   110
Pro Asn Met Val Ser Val Phe Arg Tyr Tyr Ala Gly Trp Ala Asp Lys
        115   120   125
Ile Ala Gly Lys Thr Phe Pro Glu Asp Asn Gly Lys Pro Asn Trp Arg
    130   135   140
Tyr Glu Pro Met Gly Val Cys Ala Gly Ile Ala Ser Trp Asn Ala Thr
145   150   155   160
Phe Leu Tyr Val Gly Trp Lys Ile Ala Pro Ala Leu Ala Ala Gly Cys
                165   170   175
Ser Phe Ile Phe Lys Ala Ser Glu Lys Ser Pro Leu Gly Val Leu Gly
            180   185   190
Leu Ala Pro Leu Phe Ala Glu Ala Gly Phe Pro Pro Gly Val Val Gln
        195   200   205
Phe Leu Thr Gly Ala Arg Val Thr Gly Glu Ala Leu Ala Ser His Met
    210   215   220
Asp Ile Ala Lys Ile Ser Phe Thr Arg Ser Val Gly Gly Gly Arg Ala
225   230   235   240
Val Lys Gln Ala Thr Leu Lys Ser Asn Met Lys Arg Val Thr Leu Glu
                245   250   255
Leu Gly Glu Lys Pro Thr Ile Val Phe Asn Glu Ala Pro Leu Glu Arg
            260   265   270
Gln Ser Gly Glu Ser Ala Lys Asp Phe Ser Lys Phe Gly Gln Ile Trp
        275   280   285
Val Pro Pro Ser Cys Leu Leu Val Gln Trp Gly Asn Leu Ala Glu Lys
    290   295   300
Phe His Gly Val Arg His Gly Ser Phe Gly Gly Cys Gln Arg Trp Leu
305   310   315   320
Gly Gln Asn Pro Leu Glu Pro Lys Arg Thr His Gly Pro Phe Val Asp
                325   330   335
Lys Ser Gln Tyr Asp Arg Val Leu Gly Asn Ile Asp Val Gly Lys Asp
            340   345   350
Thr Ala Gln Leu Leu Thr Gly Val Gly Arg Lys Gly Asp Lys Gly Phe
        355   360   365
Ala Ile Glu Pro Thr Ile Phe Val Asn Pro Lys Pro Gly Ser Lys Ile
    370   375   380
Trp Phe Glu Glu Ile Phe Gly Pro Val Leu Ser Ile Lys Thr Phe Lys

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385                 390                 395                 400
Thr Glu Glu Glu Ala Ile Glu Ile Ala Asn Asp Thr Thr Tyr Gly Leu
                405                 410                 415
Ala Ser Val Ile Tyr Thr Lys Ser Leu Asn Arg Gly Leu Arg Val Ser
            420                 425                 430
Ser Ala Leu Glu Thr Gly Gly Val Ser Ile Asn Phe Pro Phe Ile Pro
        435                 440                 445
Glu Thr Gln Thr Pro Phe Gly Gly Met Lys Gln Ser Gly Ser Gly Arg
    450                 455                 460
Glu Leu Gly Glu Glu Gly Leu Lys Ala Tyr Leu Glu Pro Lys Thr Ile
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Asn Ile His Val Asn Ile Glu
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<210> 6
<211> 1764
<212> DNA
<213> Exophiala spinifera

<220>
<221> misc_feature
<222> (0)...(0)
<223> permease, partially spliced cDNA

<400> 6
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ctctgcaatc gagcaggaca atatcaatta ggcaachasv caaaaaaaaa aaaaaaaaaa 1740
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aaaaaagcgg ccgctgaatt ctag 1764

<210> 7
<211> 1578
<212> DNA
<213> Exophiala spinifera

<220>
<221> misc_feature
<222> (0)...(0)
<223> permease, fully spliced cDNA

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<211> 525
<212> PRT
<213> Exophiala spinifera

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            20   25   30
Leu Asn Val Pro Leu Glu Lys Lys Gln Phe Gly Thr Ile Thr Ile Val
        35   40   45
Ser Leu Ala Phe Val Ile Cys Asn Ser Trp Ala Gly Ile Ser Gly Ser
    50   55   60

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Leu Gln Leu Ala Leu Leu Ala Gly Gly Pro Val Thr Leu Leu Tyr Gly
65                  70                  75                  80
Ile Leu Ile Ser Thr Leu Val Tyr Ile Cys Ile Ala Phe Ser Leu Ala
                85                  90                  95
Glu Leu Thr Ser Val Tyr Pro Thr Ala Gly Gly Gln Tyr His Phe Ala
            100                 105                 110
Ser Ile Leu Ala Pro Lys Ser Ile Asn Arg Ser Ile Ser Tyr Val Cys
        115                 120                 125
Gly Leu Val Ser Leu Leu Ser Trp Ile Ala Ile Gly Ser Ser Val Thr
    130                 135                 140
Met Ile Pro Ala Gln Gln Ile Pro Ala Leu Ile Ala Ala Tyr Ser His
145                 150                 155                 160
Thr Tyr Ser Gln Asp Ser Trp His Val Phe Leu Ile Tyr Glu Gly Val
                165                 170                 175
Ala Leu Val Val Leu Leu Phe Asn Leu Phe Ala Leu Lys Arg Asn Pro
            180                 185                 190
Trp Val His Glu Ile Gly Phe Gly Leu Thr Ile Ala Leu Phe Val Ile
        195                 200                 205
Ser Phe Ile Ala Ile Leu Ala Arg Ser Asn Pro Lys Ala Pro Asn Ser
    210                 215                 220
Gln Val Trp Thr Ala Trp Ser Asn Tyr Thr Gly Trp Ser Asp Gly Val
225                 230                 235                 240
Cys Phe Ile Leu Gly Leu Ser Thr Ser Cys Phe Met Phe Ile Gly Leu
                245                 250                 255
Asp Ala Ala Met His Leu Ala Glu Glu Cys Thr Asp Ala Ala Arg Thr
            260                 265                 270
Val Pro Lys Ala Val Val Ser Ala Ile Ile Ile Gly Phe Cys Thr Ala
        275                 280                 285
Phe Pro Tyr Thr Ile Ala Val Leu Tyr Gly Ile Thr Asp Leu Asp Ser
    290                 295                 300
Ile Leu Ser Ser Ala Gly Tyr Ile Pro Phe Glu Thr Met Thr Gln Ser
305                 310                 315                 320
Leu Arg Ser Leu Ser Phe Ala Thr Val Leu Ser Cys Gly Gly Ile Val
                325                 330                 335
Met Ala Phe Phe Ala Leu Asn Ala Val Gln Glu Thr Ala Ser Arg Leu
            340                 345                 350
Thr Trp Ser Phe Ala Arg Asp Asn Gly Leu Val Phe Ser Thr His Leu
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Phe Phe Ser Phe Pro Leu Thr Val Pro Thr Ala Ala Ser Thr Met Asn
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Tyr Thr Ser Ala Ile Ile Gly Val Ala Leu Ala Leu Gly Val Leu Asn
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<213> Exophiala spinifera

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Asn Val Ile Ala Leu Ile Cys Ala Ile Gly Ser Gly Ala Ser Leu Pro
50 55 60
Leu Met Ser Ile Ile Phe Gly Ser Phe Thr Asn Lys Phe Asn Asn Tyr
65 70 75 80
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Phe Val Leu Trp Phe Val Tyr Leu Phe Ile Gly Lys Phe Val Leu Thr
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Tyr Val Ser Thr Ala Ala Ile Thr Ile Ser Ala Ile Arg Thr Thr Arg
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His Phe Asp Lys Gln Ser Asn Gly Ala Ile Ala Thr Xaa Val Thr Thr
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Leu Ser Ser Ile Arg Thr Val His Ala Phe Tyr Ala Gln Lys Lys Met
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